CLAIMS

1. A method for producing a multi-viewpoint image for three-dimensional image display which acquires a multi-viewpoint image used for three-dimensional image display for providing parallax in a horizontal direction to cause a viewer to recognize three-dimensional image, comprising:

providing a plurality of viewpoints to be spaced at equal intervals in direction perpendicular to a single reference projection plane including target viewpoints serving as reference are spaced at constant intervals in a first direction parallel to the reference projection plane;

providing a plurality of individual target viewpoints which are respectively different from the target viewpoints serving as reference and serve as feet of a perpendicular to the plurality of viewpoints, corresponding to the respective viewpoint, on a projection plane which is a plane including the reference projection plane;

while the shapes and the areas of the individual projection planes which are regions in the projection planes of images acquired from the plurality of viewpoints are kept constant, making determination such that the shapes and the sizes of the individual projection planes are included in the reference projection plane in overlapping regions of the individual projection planes acquired from two viewpoints positioned at the outermost positions of the plurality of viewpoints; and

clipping only regions of the reference projection plane from the individual projection planes acquired from the respective viewpoints to form a multi-viewpoint image for three-dimensional image display.

2. The method according to claim 1, wherein the resolutions of the respective viewpoint images can be defined such that the resolution of the reference projection plane substantially coincides with the resolution of a

three-dimensional image display apparatus.

3. The method according to claim 1, wherein ranges of the respective individual projection planes are set such that the range of the reference projection plane substantially coincides with the display area of a three-dimensional image display apparatus.

4. The method according to claim 1, wherein the depression which is an angle formed by projection components of lines connecting the target viewpoint and the respective viewpoints to a plane perpendicular to the first direction and the projection plane is set to an angle of 50° to 60°.

5. The method according to claim 4, wherein the depression is 55°.

6. The method according to claim 1, wherein, regarding both the width parallel to the first direction and the width parallel to the reference projection plane and parallel to a second direction perpendicular to the first direction, images are acquired in a range of the individual projection plane having an occupation range exceeding an occupation range of the reference projection plane and images corresponding to only the ranges of the reference projection plane are clipped to be reserved as respective viewpoint images.

7. The method according to claim 6, wherein a model is not disposed on the range of the individual projection plane except for the range occupied by the reference projection plane as far as possible, or even if a model is disposed on the range of the individual projection plane except for the range occupied by the reference projection plane, the model is not rendered.

8. The method according to claim 1, wherein a longitudinal direction of a film in a photographing device is caused to

coincide with a second direction perpendicular to the first direction of the reference projection plane.

9. The method according to claim 1, wherein, by providing the projection plane above the actual floor, a displayable range in a depth direction of the three-dimensional image display apparatus is utilized.

10. The method according to claim 2, wherein ranges of the respective individual projection planes are set such that the range of the reference projection plane substantially coincides with the display area of a three-dimensional image display apparatus.

11. The method according to claim 2, wherein the depression which is an angle formed by projection components of lines connecting the target viewpoint and the respective viewpoints to a plane perpendicular to the first direction and the projection plane is set to an angle of 50° to 60°.

12. The method according to claim 11, wherein the depression is 55°.

13. The method according to claim 2, wherein, regarding both the width parallel to the first direction and the width parallel to the reference projection plane and parallel to a second direction perpendicular to the first direction, images are acquired in a range of the individual projection plane having an occupation range exceeding an occupation range of the reference projection plane and images corresponding to only the ranges of the reference projection plane are clipped to be reserved as respective viewpoint images.

14. The method according to claim 13, wherein a model is not disposed on the range of the individual projection plane except for the range occupied by the reference projection plane

as far as possible, or even if a model is disposed on the range of the individual projection plane except for the range occupied by the reference projection plane, the model is not rendered.

15. The method according to claim 2, wherein a longitudinal direction of a film in a photographing device is caused to coincide with a second direction perpendicular to the first direction of the reference projection plane.

16. The method according to claim 2, wherein, by providing the projection plane above the actual floor, a displayable range in a depth direction of the three-dimensional image display apparatus is utilized.

17. A computer-executable program for producing a multi-viewpoint image for three-dimensional image display which acquires a multi-viewpoint image used for three-dimensional image display for providing parallax in a horizontal direction to cause a viewer to recognize three-dimensional image, the program comprising instructions for:

providing a plurality of viewpoints to be spaced at equal intervals in direction perpendicular to a single reference projection plane including target viewpoints serving as reference are spaced at constant intervals in a first direction parallel to the reference projection plane;

providing a plurality of individual target viewpoints which are respectively different from the target viewpoints serving as reference and serve as feet of a perpendicular to the plurality of viewpoints, corresponding to the respective viewpoint, on a projection plane which is a plane including the reference projection plane;

while the shapes and the areas of the individual projection planes which are regions in the projection planes of images acquired from the plurality of viewpoints are kept constant, making determination such that the shapes and the

sizes of the individual projection planes are included in the reference projection plane in overlapping regions of the individual projection planes acquired from two viewpoints positioned at the outermost positions of the plurality of viewpoints; and

clipping only regions of the reference projection plane from the individual projection planes acquired from the respective viewpoints to form a multi-viewpoint image for three-dimensional image display.